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SARDAR PATEL UNIVERSITY

B.Sc. EXAMINATION

SEMESTER - I

General Chemistry (US01CCHE01)

Date: November 25, 2013 (Monday)

Time: 2:30 p.m. to 4:30 p.m.

Maximum Marks: 70

Q-1 Choose the correct option for each of the following.

[10]

- The precision of the result is also known as
(a) Accuracy (b) Error (c) Reproducibility of the result (d) Questionable value
- The error which arise due to voltage fluctuation is known as
(a) systematic error (b) Random error (c) Personal error (d) Error due to method
- _____ is not sparingly soluble salt.
(a) $\text{Ca}_3(\text{PO}_4)_2$ (b) AgI (c) CaCl_2 (d) CdS
- The conjugate base of H_3O^+ is
(a) H_2O (b) HCO_3^- (c) OH^- (d) HNO_3
- During combustion of organic compound CuO is used as
(a) Catalyst (b) Oxidizing agent (c) Solvent (d) Reducing agent
- Which reagent is used in the estimation of halogen by carius method?
(a) HNO_3 & H_2SO_4 (b) HNO_3 & HCl
(c) HNO_3 & AgNO_3 (d) All of these
- The correct IUPAC name for isobutene is
(a) 3-methyl-1-propene (b) 2-methyl-1-propene
(c) 2-methyl-2-propene (d) 3-methyl-2-propene
- The oxidation state of Co in $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ is
(a) 2 (b) 3 (c) 4 (d) 5
- The dentate character of the ligand "trien" is
(a) 2 (b) 3 (c) 4 (d) None of these
- The ligands are _____
(a) Lewis base (b) Lewis acid (c) Always a cation (d) All of these

Q-2 Attempt the following. (Any Ten)

[20]

- List the factors affecting the selection of method for analysis.
- Describe briefly standard addition method.
- Describe briefly internal standard method.
- Why the solubility of AgCl decreases in aqueous solution of AgNO_3 ?
- Define P^{H} . How the P^{H} scale is useful to classify the solution.
- The solubility product of AgCl is 2.8×10^{-10} . Determine the solubility of AgCl in pure water.
- Give structure and IUPAC names for all possible isomers of C_5H_{12} .
- What is % carbon present in $\text{C}_3\text{H}_7\text{Cl}$ having molecular weight 78.5 gm/mole?
- Give classification of hydrocarbon.
- Define chelate and give its analytical application.
- Define coordination number and explain stereochemistry of coordination number 2.
- What is addition compound?

Conti...

Q-3 Attempt the following.

- (a) Give complete classification of chemical analysis. [05]
(b) Define accuracy and precision. Show that Precision always accompanies accuracy but high degree of precision does not mean accuracy. [05]

OR

Q-3 Attempt the following.

- (a) Define error. Describe various types of error. [05]
(b) Explain -"Analytical chemistry is an interdisciplinary branch" [05]

Q-4 What do you mean by strong acid and weak acid? Describe various concepts of acids and bases. [10]

OR

Q-4 Define solubility and solubility product. Calculate the solubility of CaF_2 in (i) 0.1M $\text{Ca}(\text{NO}_3)_2$ and (ii) 0.1M NaF solution. [K_{SP} of $\text{CaF}_2 = 1.7 \times 10^{-10}$] [10]

Q-5 Attempt the following.

- (a) Discuss Kjeldahl's methods for estimation of nitrogen present in organic compound. [04]
(b) Following names are objectionable. Write the correct name & their structure. [03]
(i) 3-methyl-2-butene (ii) 2,2-diethyl butane (iii) 2-propyl-1-propene
(c) Draw the structure & write the IUPAC name for the following. [03]
(i) Isobutylene (ii) Neohexane (iii) sec-butyl chloride

OR

Q-5 Attempt the following.

- (a) Discuss the test for the detection of N, S, and halogen present in organic compound. [04]
(b) Draw E/Z isomers for the following. [03]
(i) 2-bromo-1-chloropropene (ii) 2-bromo-2-butene (iii) 1-chloro-2-methyl-2-butene
(c) The boiling point of n-Butane, n-Pentane & n-Hexane is 0° , 36° & 69°C respectively. Explain. [03]

Q-6 Attempt the following.

- (a) In the coordination compound $[\text{CrCl}(\text{H}_2\text{O})(\text{en})_2]\text{Cl}_2$ [05]
(i) The oxidation state of chromium ion is _____
(ii) The coordination number of chromium is _____
(iii) The dentate character of different ligand are _____
(iv) Ionic charge on complex cation is _____
(v) The number of non-coordinated chlorine ion is _____
(b) Explain [05]
(i) Every multidentate ligand is not necessarily a chelating ligand.
(ii) Sulphate (SO_4^{2-}) is flexidentate ligand.

OR

Q-6 Attempt the following.

- (a) Discuss stereochemistry of coordination numbers 3 to 6. Give at least one example of each. [05]
(b) Give IUPAC name of following coordination compounds. [05]
 H_3CoCl_6 , $[\text{Ni}(\text{CN})_4]^{4-}$, $[\text{CoBr}_3(\text{H}_2\text{O})(\text{en})]^{2+}$
 $\text{K}[\text{SbCl}_5(\text{C}_6\text{H}_5)]$, $[\text{CrCl}_2(\text{H}_2\text{O})_4]^+$